IN THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1(Currently Amended). A method of ~~reduced complexity~~ TCM decoding, the method comprising the steps of:

a) receiving a soft symbol;

b) choosing a constellation point ~~closet~~ closest to the received soft symbol for each TCM subset;

c) calculating the metric of each branch based on the distance ~~(for example squared Euclidean distance)~~ of the chosen point from the received symbol, wherein the distance is Euclidean distance;

d) calculating new state metrics for each trellis state [[,]] as the minimum of the sums of all possible previous states and appropriate branch ~~(previous state + appropriate branch)~~ that lead to a new state;

e) selecting the state with the smallest metric; and

f) tracing back from the state with the smallest metric, to determine the state and appropriate transmitted symbol(s) having a delay based on the traceback length,

wherein steps b and c together choose between parallel branches between states in the trellis, and assign branch metrics to each branch and each branch metric is calculated by adding the absolute value of the real and imaginary parts of the complex vector resulting from the subtraction of the received symbol and the closest symbol in each subset to implement simplified metric VA decoding.

2(Original). The method according to claim 1, further comprising repeating steps a-f for each received soft symbol.

3 – 4. Canceled

5(Currently Amended). The method according to claim [[3]] 1, wherein only the branch metrics of the subsets of some symbols closest to the received symbol are calculated; and the metrics for all other subsets are set to a predefined (saturated) value, set independently for each constellation.

6(Original). The method according to claim 5, wherein for received symbols outside the constellation, only two metrics are calculated based on the constellation points closest to the received symbol, while metrics for all other subsets are set to a predefined (saturated) value, set independently for each constellation, to implement reduced complexity VA decoding.

7(Original). The method according to claim 6, wherein the branch metric that is calculated is calculated by adding the absolute value of the real and imaginary parts of the complex vector resulting from the subtraction of the received symbol and the closest symbol in the subset to implement reduced complexity simplified metric VA decoding.

8(Currently Amended). The method according to claim [[3]] 1, wherein only the branch metrics of the subsets of the four symbols closest to the received symbol are calculated; the metrics for all other subsets are set to a predefined (saturated) value, set independently for each constellation; and for received symbols outside the constellation, only two metrics are calculated, while metrics for all other subsets are saturated, to implement reduced complexity VA decoding.

9(Original). The method according to claim 8, wherein the branch metric that is calculated is calculated by adding the absolute value of the real and imaginary parts of the complex vector resulting from the subtraction of the received symbol and the closest symbol in the subset to implement reduced complexity simplified metric VA decoding.

10(Original). The method according to claim 1, wherein calculating the metric of each branch based on the distance comprises calculating the squared Euclidean distance.

11(Currently Amended). A method of implementing a VA on a DSP, the method comprising the steps of:

a) receiving a soft symbol;

b) for each TCM subset, choosing the constellation point closest to the received symbol;

c) calculating the distance of this selected point from the received symbol, via choosing between parallel branches between states in the trellis, and assigning branch metrics to each branch;

d) Examining each trellis state and calculating new state metrics as the minimum of the sums of all possible previous states and appropriate branch ~~(previous state + appropriate branch)~~ that lead to this state;

e) Selecting the state with the smallest metric, and tracing back from this state to decide in the state and appropriate transmitted symbol(s) with delay based on the traceback length; and

f) Repeating steps a-e,

wherein steps b and c together choose between parallel branches between states in the trellis, and assign branch metrics to each branch and each branch metric is calculated by adding the absolute value of the real and imaginary parts of the complex vector resulting from the subtraction of the received symbol and the closest symbol in each subset to implement simplified metric VA decoding.

12(Original). The method according to claim 11, wherein step e is selectively repeated at each iteration or in a batch manner.

13(Original). The method according to claim 11, wherein choosing between parallel branches between states in the trellis, and assigning branch metrics to each branch in step c comprises the steps of:

a. dividing the constellation space into regions, so that trellis metrics located within a region will be calculated related to the same N symbols, where N is the number of subsets in the TCM;

b. slicing the received symbol, based on these regions, where this slicing operation simultaneously selects the best symbol in each of the N subsets; and

c. calculating the distance between the received symbol and the selected constellation point in each subset based on the distance of the received symbol and a predefined "region representing point" representing each of the regions, and the distance of the "region representing point" and the corresponding constellation point in each subset that is calculated a priori, and stored in a look-up table.

14(Original). The method according to claim 13 wherein the distance in step c is the squared Euclidean distance.

15(Original). The method according to claim 13, wherein only the branch metrics of the subsets of some symbols closest to the received symbol are calculated; and the metrics for all other subsets are set to a predefined (saturated) value, set independently for each constellation.

16(Original). The method according to claim 13, wherein the distance in step c is calculated by adding the absolute value of the real and imaginary parts of the complex distance vectors to implement simplified metric VA decoding.

17(Original). The method according to claim 16, wherein only the branch metrics of the subsets of some symbols closest to the received symbol are calculated; the metrics for all other subsets are set to a predefined (saturated) value, set independently for each constellation, and wherein for received symbols outside the constellation, only two metrics are calculated based on the constellation points closest to the received symbol, while metrics for all other subsets are set to a predefined (saturated) value, set independently for each constellation, to implement reduced complexity simplified metric VA decoding on a DSP.

18(Original). The method according to claim 17, wherein for received symbols outside the constellation, only two metrics are calculated based on the constellation points closest to the received symbol, while metrics for all other subsets are set to a predefined (saturated) value, set independently for each constellation, to implement reduced complexity VA decoding on a DSP.